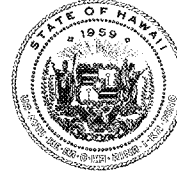




**UNITED STATES ENVIRONMENTAL
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REGION IX
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**STATE OF HAWAII
DEPARTMENT OF HEALTH
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Mr. Mark Manfredi
U.S. Navy Red Hill Project Coordinator
850 Ticonderoga Street, Suite 100
Joint Base Pearl Harbor Hickam, Hawaii 96860

Re: Comments from the In-Progress Review of Quantitative Risk and Vulnerability Assessment for Red Hill Administrative Order on Consent ("AOC") Statement of Work ("SOW") Section 8.3- Risk/Vulnerability Assessment Report

Dear Mr. Manfredi:

The U.S. Environmental Protection Agency ("EPA") and Hawaii Department of Health ("DOH"), herein collectively referred to as "the Regulatory Agencies", appreciate the opportunity to meet with the U.S. Department of the Navy ("Navy"), Defense Logistics Agency ("DLA") and your consultant (herein referred to as "Navy"), ABSG Consulting, to discuss a quantitative risk and vulnerability assessment ("QRVA") being developed for the Red Hill Fuel Storage Facility as a requirement under the AOC. The QRVA will include a complex analysis of the potential future event sequences that could result in an uncontrolled fuel release from the facility and their probability of occurrence. This analysis should enable the Navy to efficiently focus its efforts towards improvements that will most effectively reduce the risk of releases from the facility.

Meetings for the in-progress review were held in Irvine, California from December 5th to December 7th. U.S. EPA attended the meetings in person with the Navy, DLA, and DOH participated via conference call. The Honolulu Board of Water Supply and their consultants participated in the discussions on December 5th and December 7th. The Regulatory Agencies are providing the comments and observations below after reviewing the proposed preliminary inputs to the risk assessment and our discussions during the three days of meetings.

1. The Regulatory Agencies are interested in the data and other supporting information that the Navy will use to evaluate its ability to detect and respond to initiating events not only for the entire facility, but also for the tanks specifically. The magnitude of any uncontrolled release is highly correlated with the ability to detect and respond to the initiating event(s). Releases that go undetected over long periods of time, or releases that are detected but do not receive an effective response can result in large-

scale events that may pose a significant risk to groundwater and drinking water. The Regulatory Agencies believe there is opportunity to reduce risk at the facility by improving release detection and response practices.

2. The Regulatory Agencies recommend that the Navy evaluate the likelihood of initiating events from the tank vessels using various sources of generic data as well as Red Hill specific data, and consider including a discussion on the range of likelihoods using these different data sources. As new corrosion and pitting data from scanning the tanks during inspections becomes available, the Navy should determine whether and how this site-specific scanning data could be incorporated to revise the likelihood of an initiating event from the tanks. Considering these recommendations, the Navy and its consultant should ultimately provide their assessment of the likelihood of an initiating event, based on their professional judgement.
3. The Regulatory Agencies recommend that the Navy continue to collect data on the human factors related to release detection and response. During our meetings, it did not appear that ABSG Consulting had sufficient relevant information related to the initiation of and response to the January 2014 release. Improvements in these human factors after the January 2014 release should only be credited due demonstrable actions, such as written operating procedures, training, etc.
4. The Navy should consider quantification of thresholds of detection during static and transient (fuel movement) operations to define range and probable release sizes. This can be achieved by applying the standard tools of the QRVA already under way.
5. The Regulatory Agencies suggest segregating the release assessment into two physical areas that contain fuel. The first area would focus on the tank vessels. This would include the tank vessel and nozzle to the point of the first valve. The second area would focus on the mechanical infrastructure attached to the tank vessels, such as the piping, valves and pumps. Estimating the frequency of an initiating event from the second area may have less uncertainty due to the more standard nature of infrastructure. Understanding how the risk nature and magnitude of risk posed by these distinct physical areas is important for risk management decisions.
7. Historical data should be incorporated thoughtfully into the QRVA. The Navy should characterize whether data is useful and relevant given the facility's current configuration. For example, many previous initiating events were the result of leaks in the telltale system that was eventually decommissioned in 1984. Additionally, other leaks were the result of faulty repairs, such as what occurred during the January 2014 release from tank 5. The Navy should consider partitioning the probability of initiating events into those that may occur during different modes of normal operation (static storage, fuel movements, etc.), and those that may occur during other periods, such as recommissioning.

8. The Navy should review environmental data trends from soil vapor monitoring probes and groundwater monitoring wells and discuss whether any aberrations correspond to historical releases from the facility.
9. The Regulatory Agencies suggest revising the categorization of leak magnitude ranges for initiating events. Currently the assessment indicates three general ranges which are:
 - Undetected (below 0.7 gallon per hour or 16.8 gallons per day)
 - Small (below 72,000 gallons per day)
 - Large (above 72,000 gallons per day)

We suggest further segregating the small category range because 72,000 gallons per day may be much greater than a release caused by corrosion hole or crack. Per our preliminary calculation, 1/10th of an inch diameter hole could produce a leak of approximately 3,700 gallons per day at 175-foot fill level assuming no back pressure on the hole. Given that the primary initiating event of concern consists of a through-hole corrosion or crack that has not been detected during tank inspection, the QRVA should reflect a conservative, but realistic initiating event. We suggest further research on corrosion/crack failures from data in the fuel industry to obtain a more realistic initiating event estimate.

10. The Regulatory Agencies encourage the Navy to dedicate resources in risk communication and interpretation. The analysis and outcomes of this QRVA involve sophisticated numerical analysis and it will be important to convey this information in a manner that is conducive for public consumption. We recommend that the Navy include an executive summary and conclusion that clearly summarize the study. The Navy should also develop other communication materials when the Report is submitted to the Regulatory Agencies, such as a two-page fact sheet.

Sincerely,

Bob Pallarino
Project Coordinator
EPA Region 9 Land Division

Roxanne Kwan
Project Coordinator
DOH Solid and Hazardous Waste Branch

cc: Mark S. Manfredi, Navy (via email)
John Montgomery, Navy (via email)